SESSION FOUR

Climate Change and Natural Hazard Risk Assessment and Disclosures

DANIEL DEATON
Partner
Nixon Peabody LLP

RENEE DOUGHERTY, CFA
Director, Municipal Research
Charles Schwab Asset Management

BRIAN MCCARTAN
Senior Fellow
Ceres, Inc.

JAN WHITTINGTON, PhD
Professor
University of Washington, Seattle

SESSION FOUR

Climate Change and Natural Hazard Risk Assessment and Disclosures

DANIEL DEATON
Partner
Nixon Peabody LLP

SESSION FOUR

Climate Change and Natural Hazard Risk Assessment and Disclosures

JAN WHITTINGTON

Professor, U of Washington
CEO, Climate Solutions Intl.

Issuer Capacity to Assess Climate Risk

- CA Govts have a mandate, talent, and capital budgets / financial plans
- There are tools and data with forecasts from global climate models
- Climate risk info can be localized (downscaled) to visualize risk over time
- Historical studies have made forecasts of material loss and damage possible
- Issuers can adapt capital budgets / financial plans to disclose climate risk

California law (SB 379) Mandated Assessments of Vulnerability

- Required all cities and counties to
  - Address climate adaptation and resiliency strategies
  - Applicable to the city or county
  - In the 'safety elements' of their general plans or FEMA-mandated local hazard mitigation plans

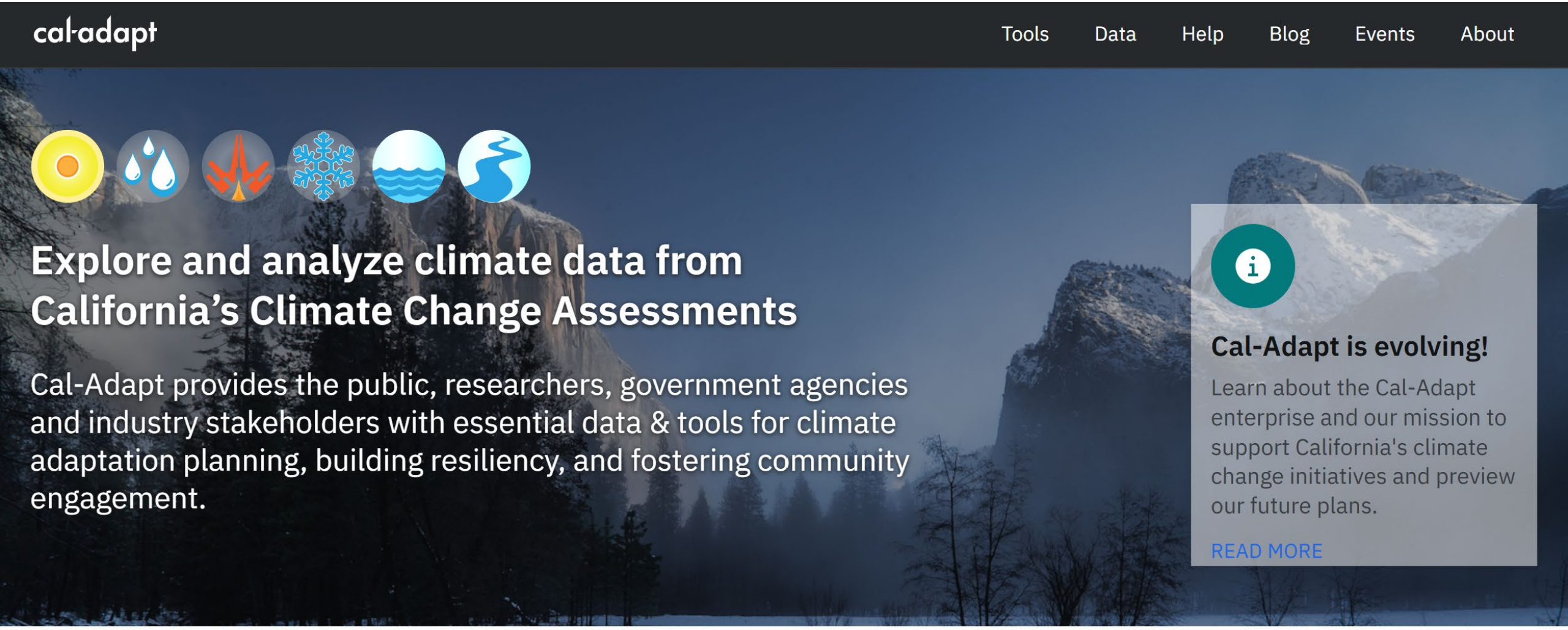
    Learn more at ResilientCA.org

- Key question
  - Is this used in capital budgets / financial plans?

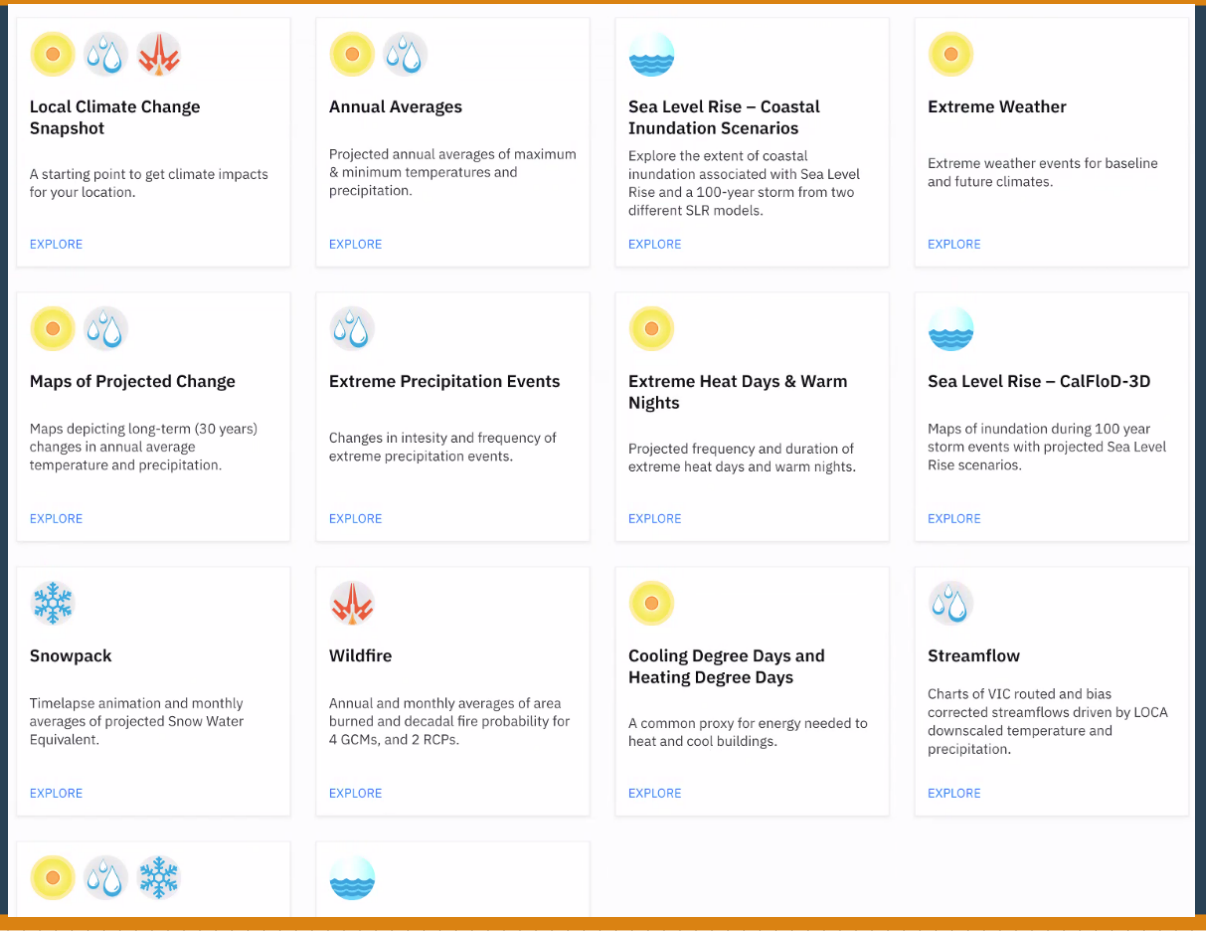
Local Gov't. Approaches to Assessing Climate Risk Vary

- CA publicly available tool: CalAdapt
  - Helpful access to data from global climate models
  - Needs more work to localize risk to assets
- Some Cities and Counties have localized risk
  - Still challenged to integrate with budget & finance

CalAdapt is a Starting Point for Climate Risk Assessments

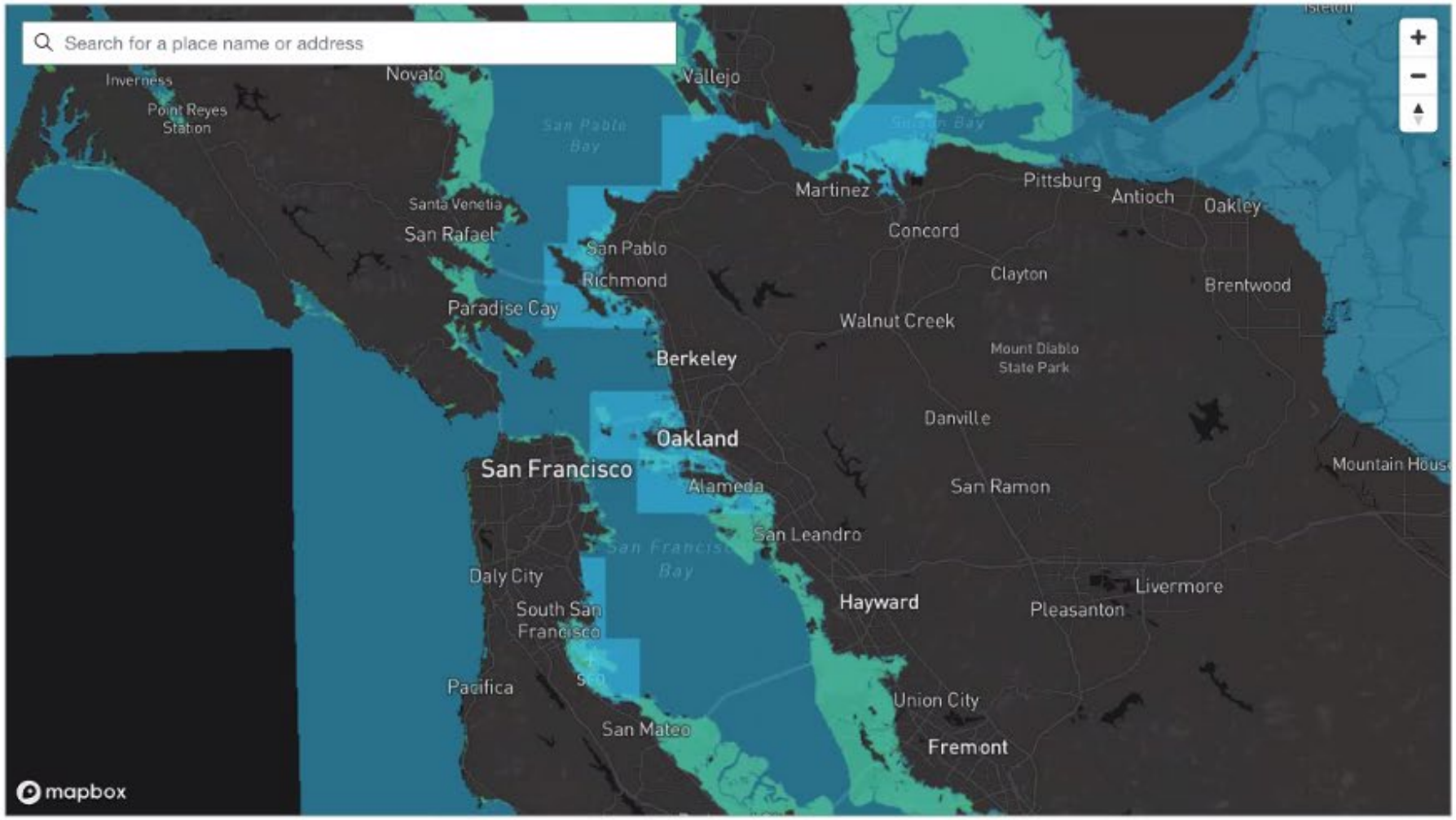


CalAdapt is a Toolkit for Accessing Global Climate Models



CalAdapt: Sea Level Rise

Showing available data for **CoSMoS** and **CalFloD3D-TFS (5m)** and **CalFloD3D-TFS (50m)** under a **median** flood scenario for the **2080–2100** period.



SELECT MAP DATA LAYERS

- [x] CoSMoS
- [x] CalFloD3D-TFS (5m)
- [x] CalFloD3D-TFS (50m)

Learn More

SELECT TIME PERIOD

- ( ) 2020–2040
- (•) 2080–2100

Learn More

SELECT FLOOD SCENARIO

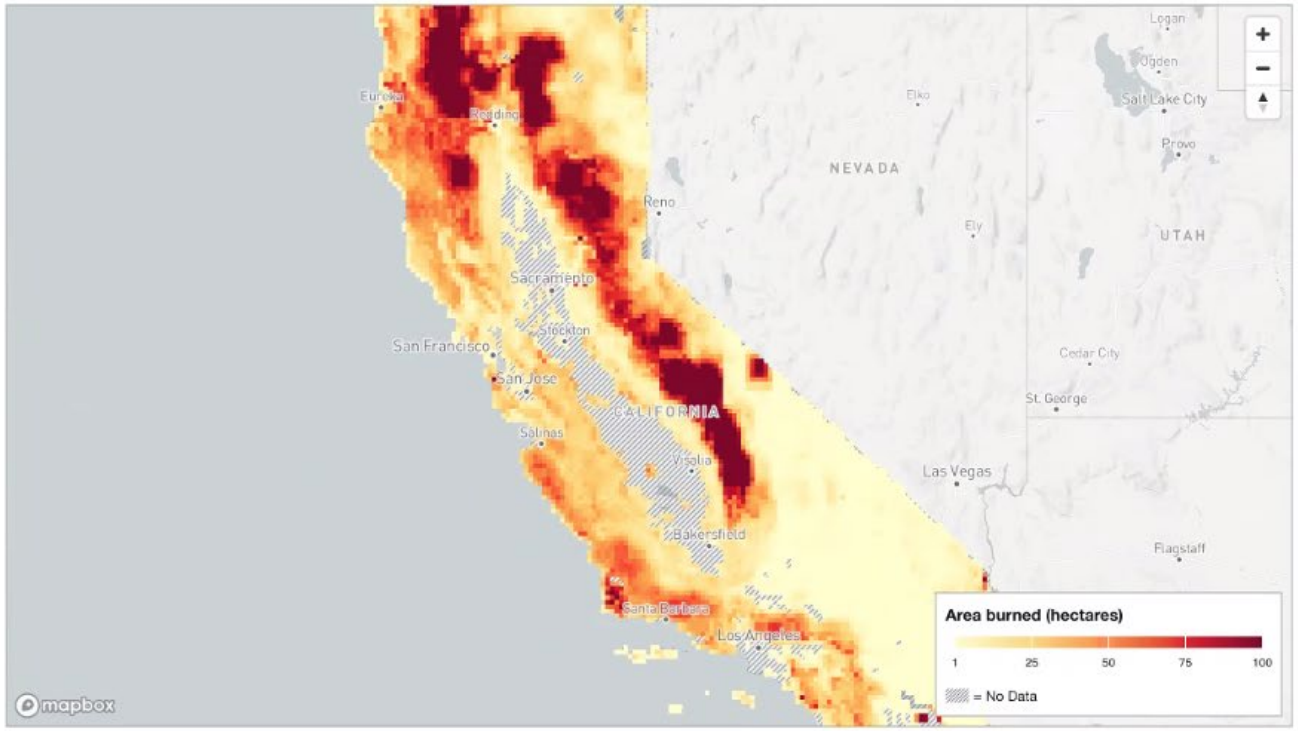
- ( ) minimum
- (•) median
- ( ) maximum

Learn More

CalAdapt: Wildfire

Decadal Averages Map showing **Modeled Annual Area Burned** over **2090–2099** under a **High Emissions (RCP 8.5) Scenario** and Central Population Growth scenario for **HadGEM2-ES**

Locations outside the combined state and federal fire protection responsibility areas were excluded from these wildfire simulations and have no wildfire projections.. These areas are shaded in gray.



SELECT TIME RANGE

1960–1969 | 1970–1979 | 1980–1989 | 1990–1999 | 2000–2009 | 2010–2019 | 2020–2029 | 2030–2039 | 2040–2049 | 2050–2059 | 2060–2069 | 2070–2079 | 2080–2089 | 2090–2099

Decadal wildfire probability
Learn More

SELECT SCENARIO
- Medium (RCP 4.5)
- High (RCP 8.5)

Learn More

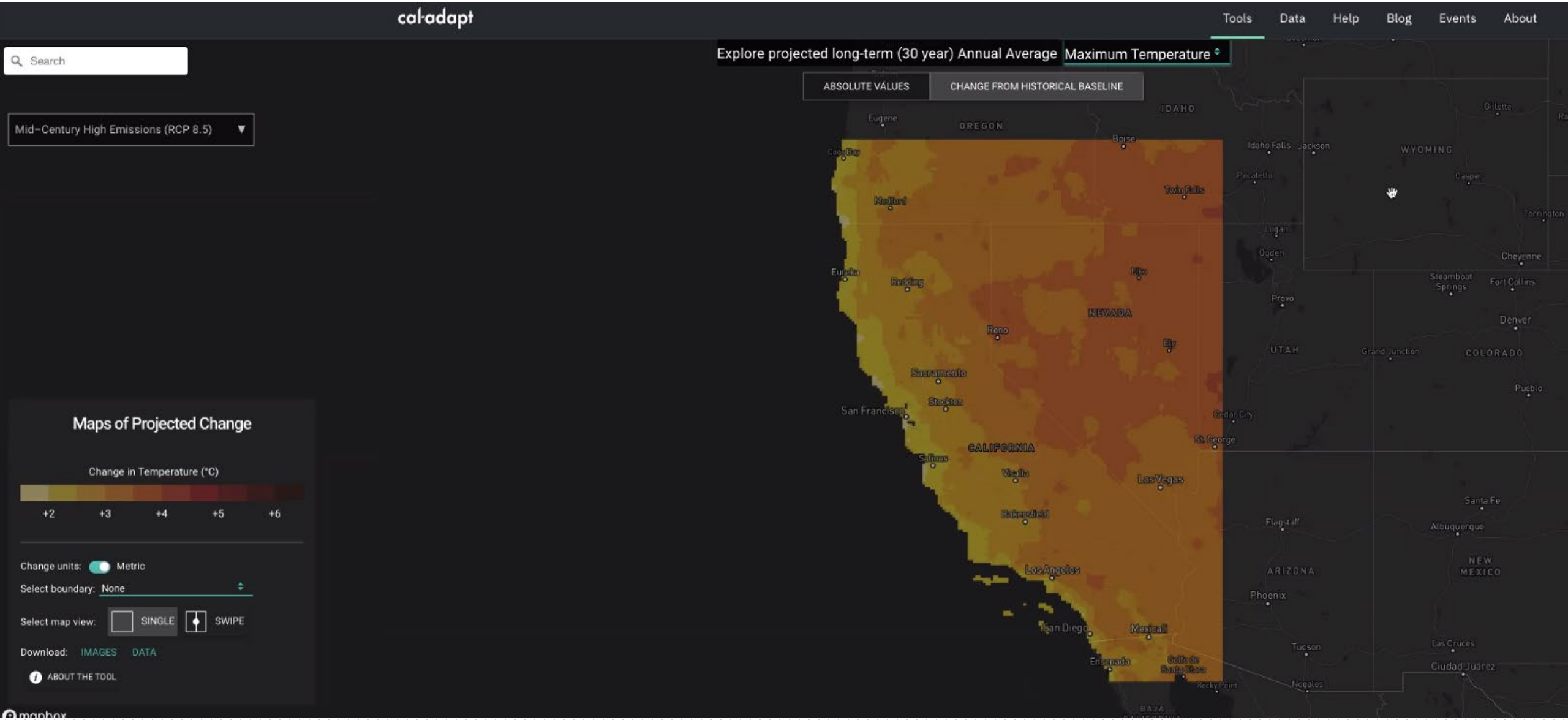
SELECT SIMULATION
- Annually
- Monthly

Learn More

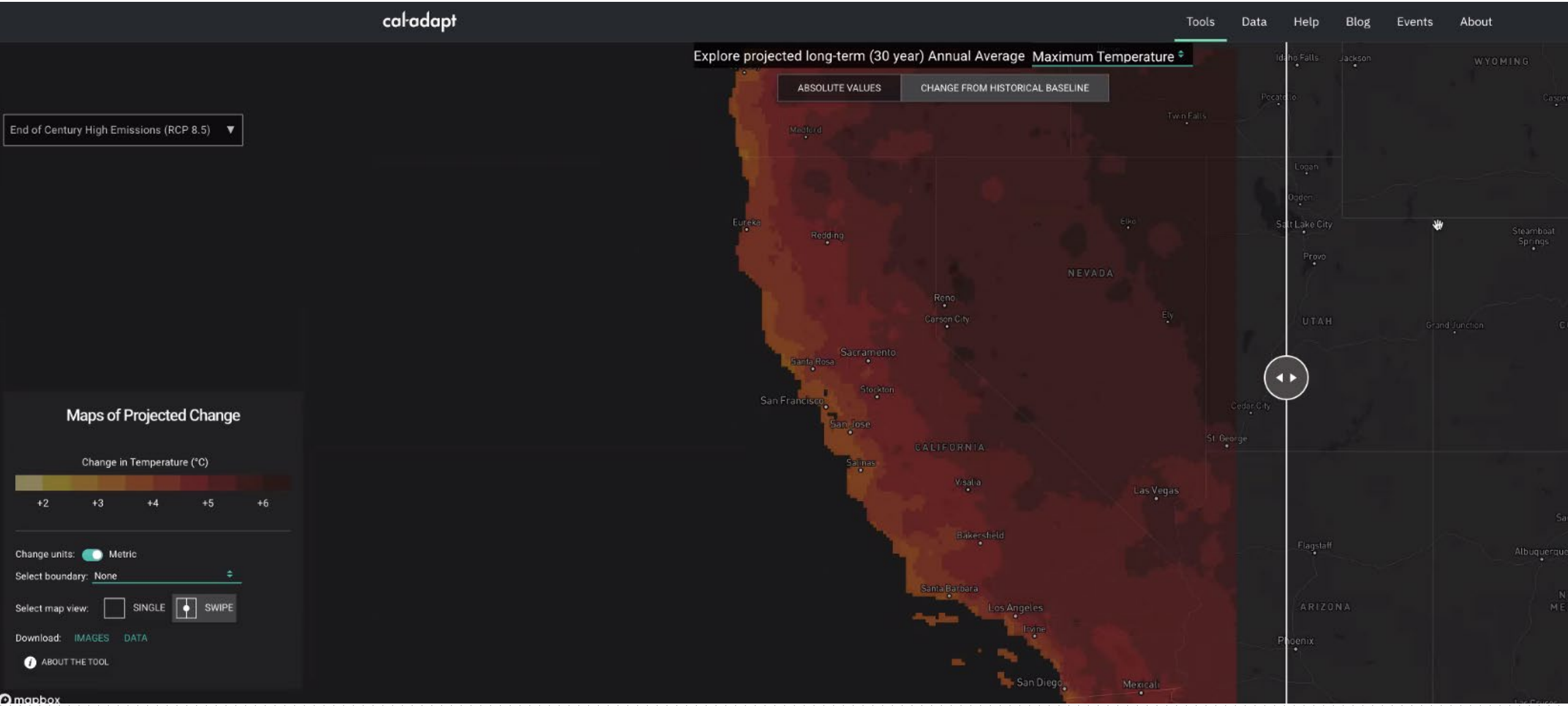
SELECT MODEL
HadGEM2-ES (Warm/Dry)

Learn More

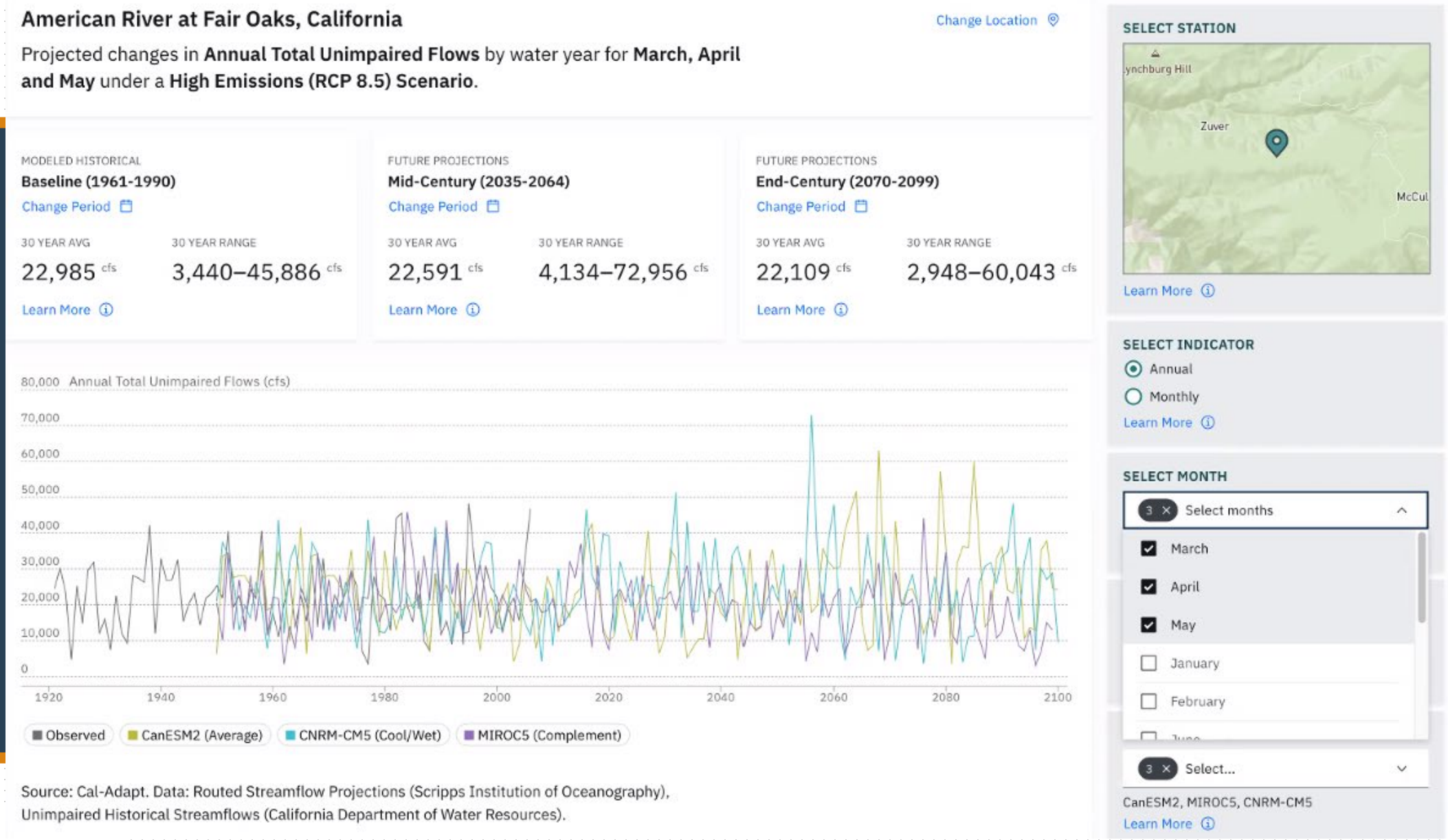
CalAdapt: Max Temperature Rise (Mid-Century)



CalAdapt: Max Temperature Rise (End of Century)



CalAdapt: Extreme Precipitation as Stream Flow



Climate Risks Need to be Localized and Monetized

- Localize
  - CalAdapt
    - Wildfire
    - Sea Level Rise (but will need tides + precipitation)
  - Get to parcel level projections, 2100
    - Urban Heat Island Effect (Temperature)
    - Flooding (Precipitation)

- Monetize
  - Is this used in capital budgets / financial plans?

Example of Localized Climate Risk: City of San Luis Obispo

CITY OF SAN LUIS OBISPO | LIVING | VISITING | GOVERNMENT | SERVICES | BUSINESS | I WANT TO...

- COMMUNITY DEVELOPMENT
  - + Key Information & Reporting
  - + Cannabis
  - - Planning & Zoning
    - + Zoning
      - Zoning Map
      - Specific & Area Plans
      - Planning Permits
      - Tiny Home on Wheels
    - - General Plan
      - Housing Element
      - Noise Element
      - Safety Element
      - Conservation and Open Space Element

Government » Department Directory » Community Development » Planning & Zoning » General Plan »

CLIMATE ADAPTATION AND SAFETY ELEMENT

Font Size: + − | Share & Bookmark | Feedback | Print

The Safety Element of the General Plan was last updated on January 17, 2023, in accordance with state law (Senate Bill 379 Government Code Section 65302) that requires integration of comprehensive climate adaptation and resilience strategies, the City applied and received a Sustainable Communities Grant from the California Department of Transportation.

Under state law, a safety element promotes protection for the community from unreasonable risks related to slope instability, seismic activity, subsidence, liquefaction, known geologic hazards, flooding, wildland and urban fires, tsunami, seiche,

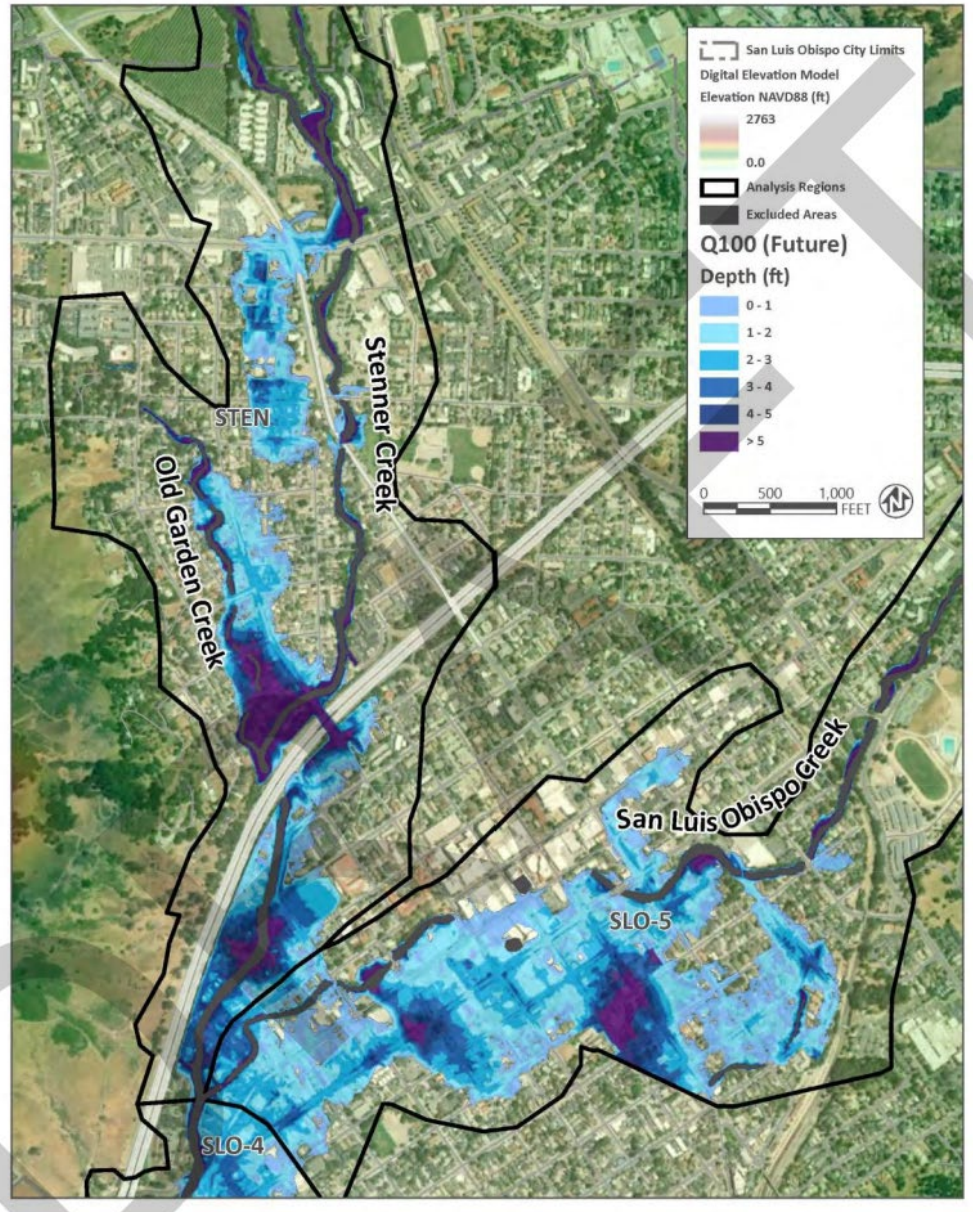
FAQ Box

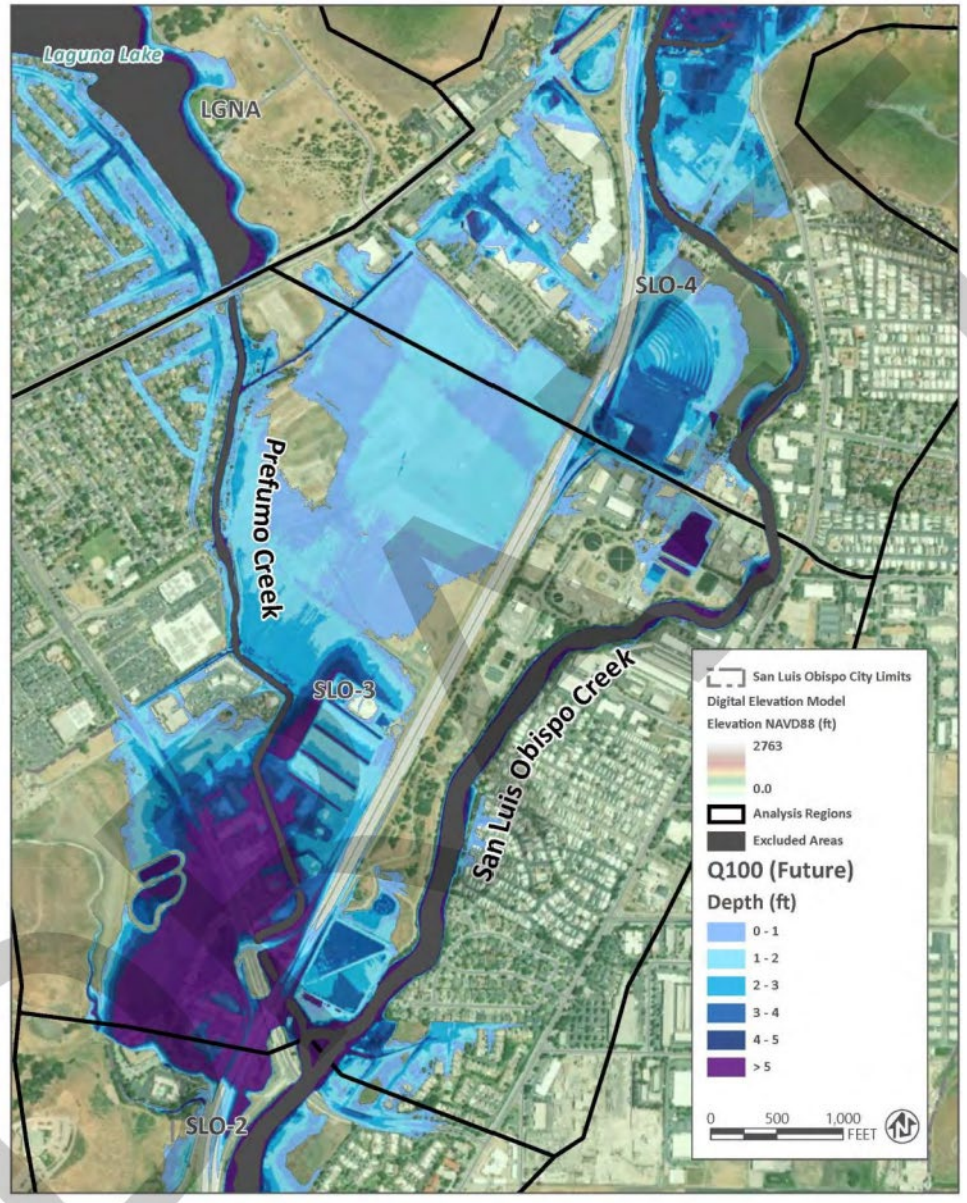
Will a traffic impact study be required and if so what is the process?

How do I apply for a permit?

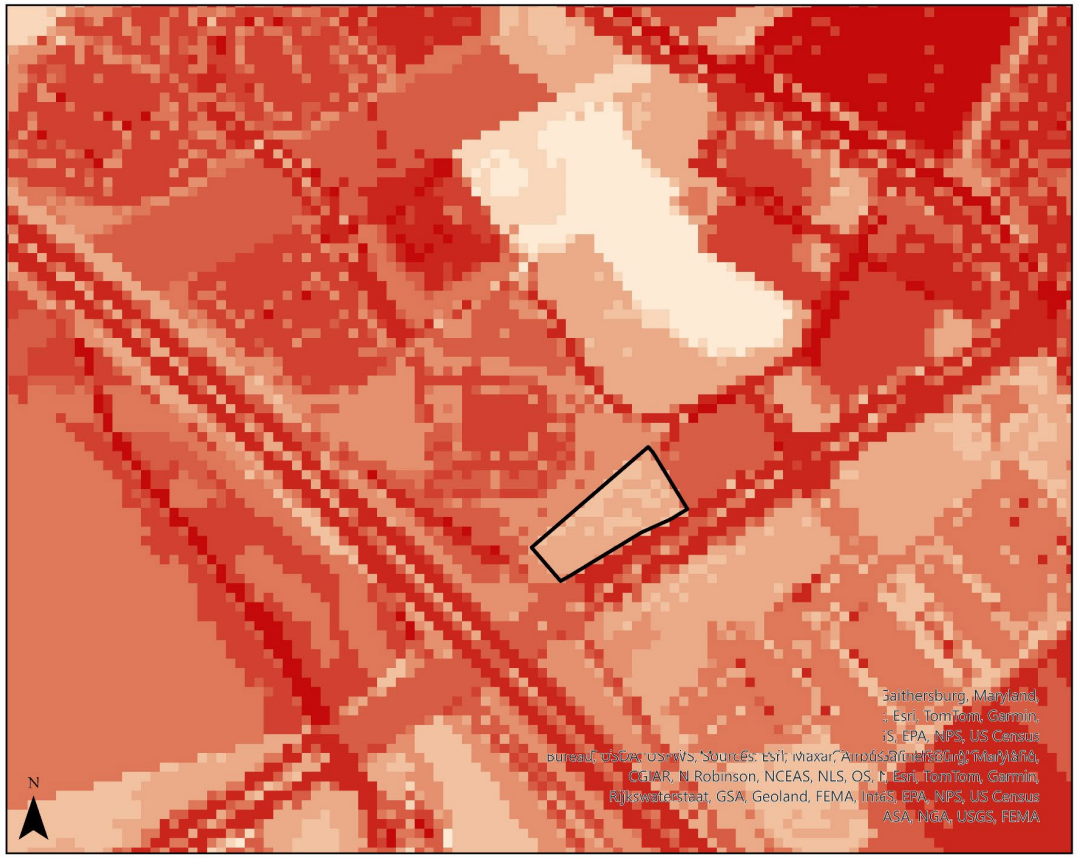
What type of approval

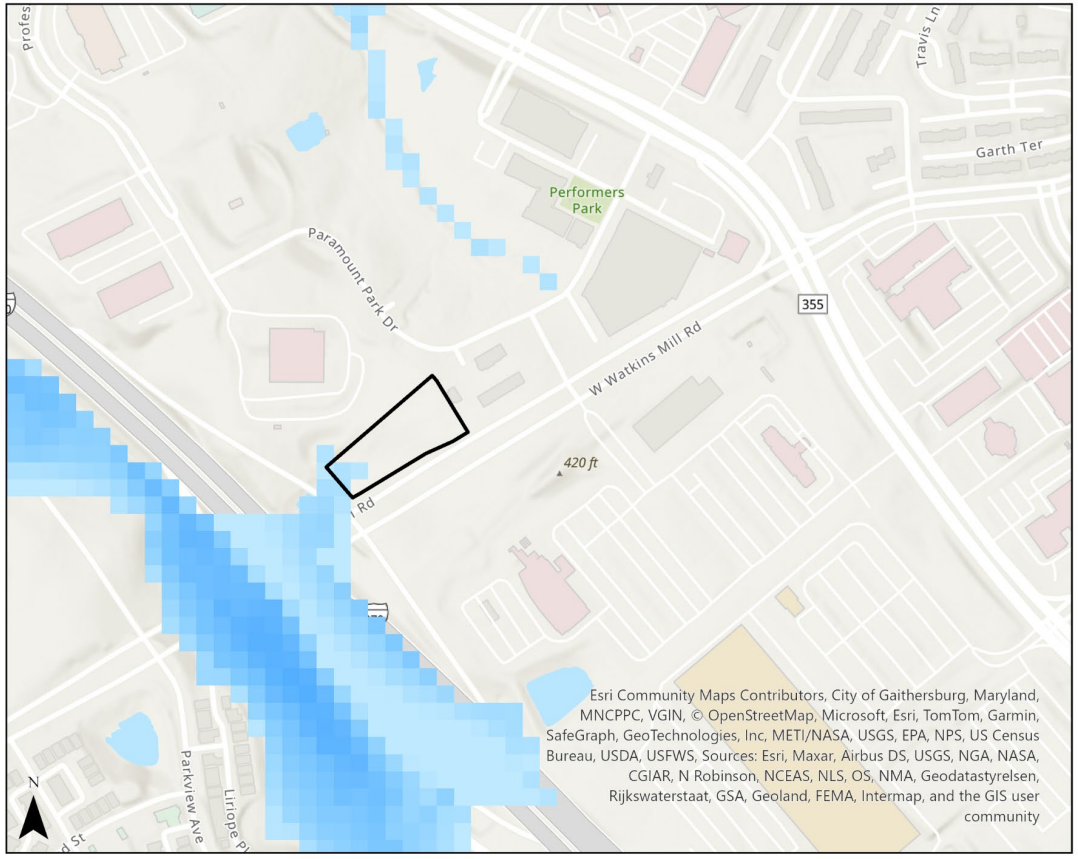
Example of Localized Flood Risk: City of San Luis Obispo





Example of Localization (Climate Solutions Intl.)





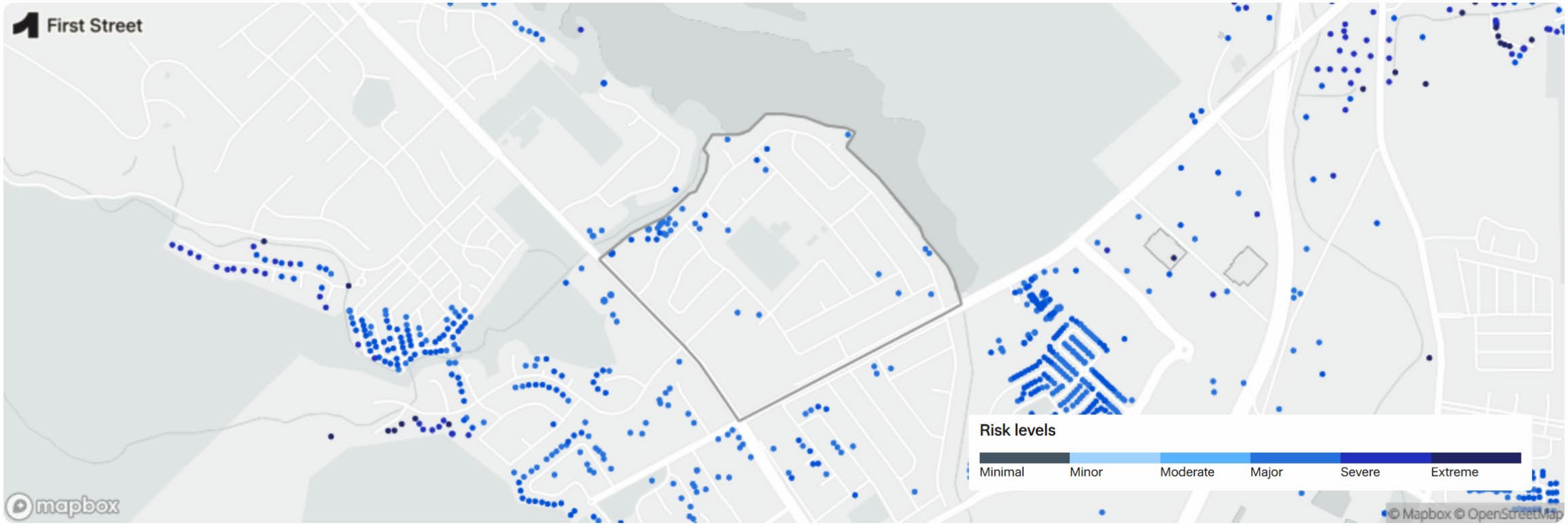
Why Disclose?

- Don’t let fear of public reaction prevent disclosure
  - Data is already out there! (Riskfactor.com)
  - It’s designed for residential (30-year forecast)
  - It’s not the right data for Cities/Counties
- Cities and Counties need to show they know
  - With better data for their purposes
  - Incorporated into their planning and budgeting process

Example from Riskfactor.com for Residential Risk

Flood Factor | Fire Factor | Air Factor | Heat Factor

Madonna Flood Map



Community Impact from Flooding in Madonna

In addition to property damage, flooding can cut off access to utilities, emergency services, transportation,

Find the Flood Risk for Any Property

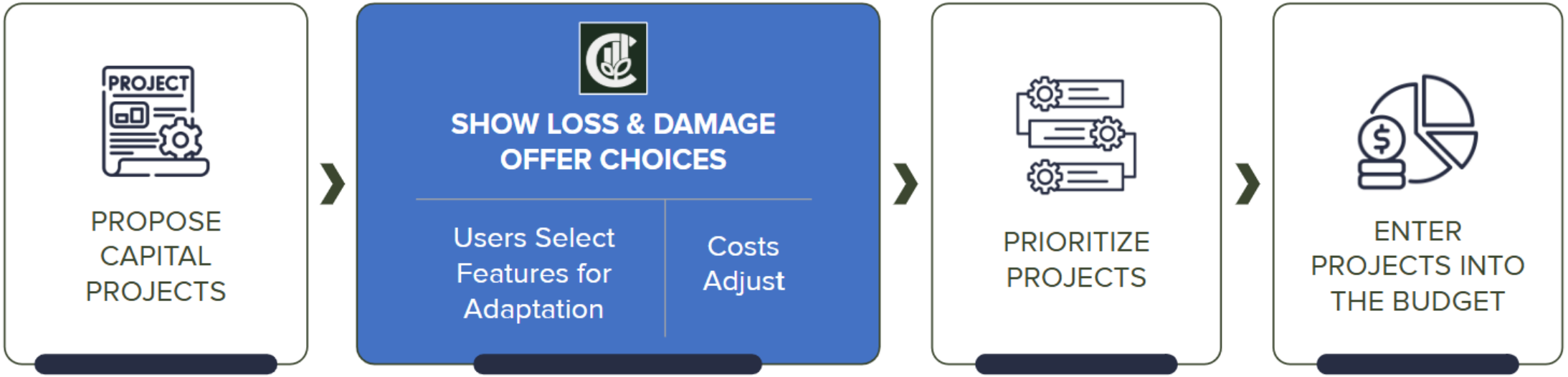
About Monetizing Climate Risk

- The Cost of Doing Nothing (it's a Forecast)
  - A business-as-usual baseline
  - It is a forecast of loss and damage
  - Adaptation brings forecasts of avoided loss and damage

- The Key is to Integrate these Measures
  - in Capital Plans and Budgets
  - In Financial plans

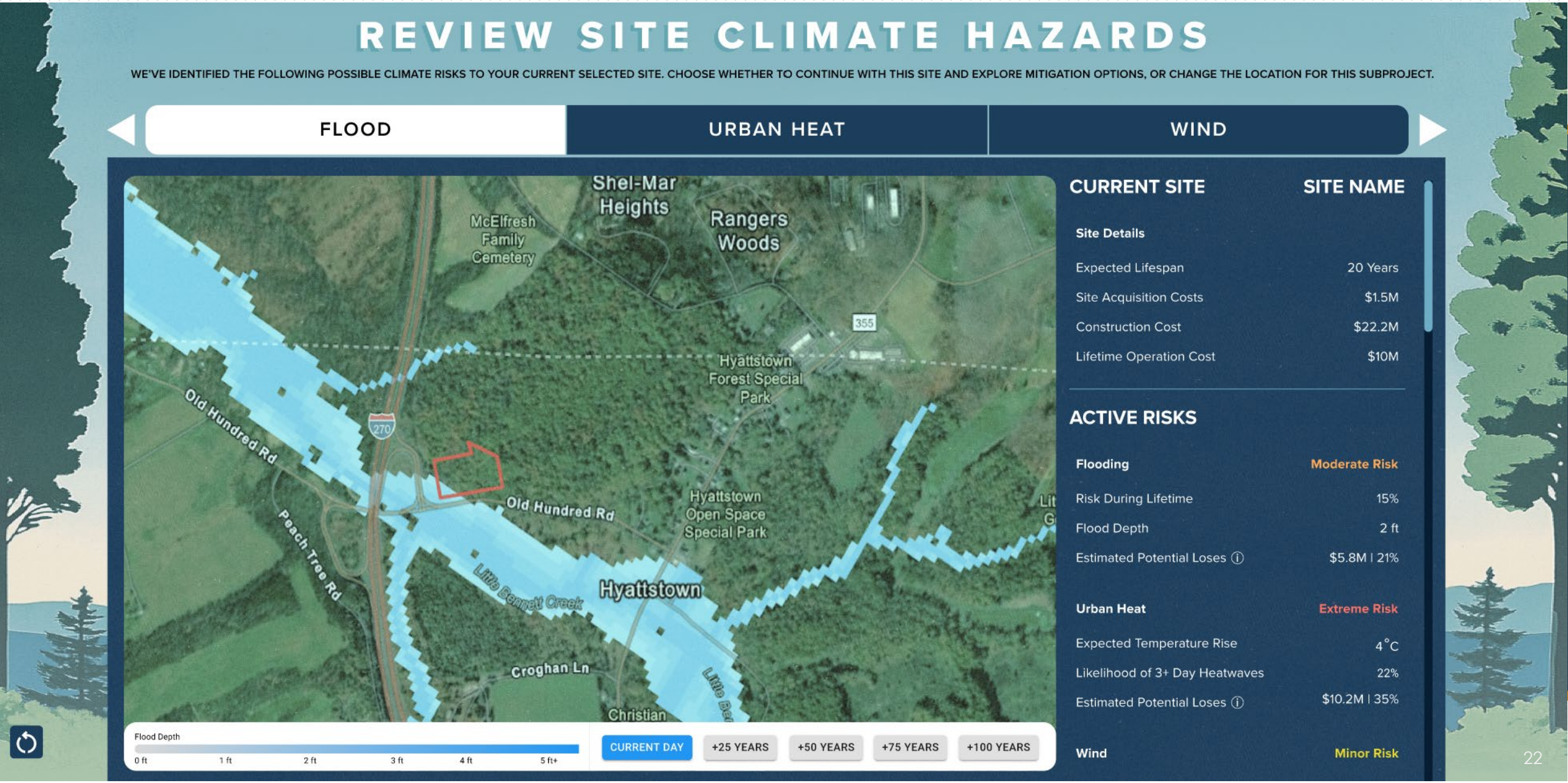
Example: Capital Budgets

- Climate Solutions International's Approach
  - Integrate with existing capital budgeting process



climatesolutionsintl.com

Example of Monetization: Climate Solutions Intl. Software



Example of Monetization: Climate Solutions Intl. Software

Example of Monetization: Climate Solutions Intl. Software

THANK YOU!

JAN WHITTINGTON
Professor, U of Washington
CEO, Climate Solutions Intl.

SESSION FOUR

Climate Change and Natural Hazard Risk Assessment and Disclosures

BRIAN MCCARTAN

Senior Fellow

Ceres, Inc.

Important Disclosures

- The comments, views, and opinions expressed in the presentation are those of the speaker. The content presented is intended for informational purposes only. Neither Schwab Asset Management™ nor Charles Schwab & Co., Inc. (Schwab) endorse nor can make a representation as to the accuracy, timeliness or completeness of the information presented.

- Schwab Asset Management™ is the dba name for Charles Schwab Investment Management, Inc. Schwab Asset Management and Schwab are separate but affiliated companies and subsidiaries of The Charles Schwab Corporation.

Benefits of Strong Natural Hazard Risk Disclosure

- Reveals good governance if you have a climate risk strategy
- Provides investor confidence and trust in management
- Allows the Issuer to shape the "story", not the headlines
- May reduce market price volatility after an adverse event
- May improve investor demand if debt is issued to finance recovery efforts

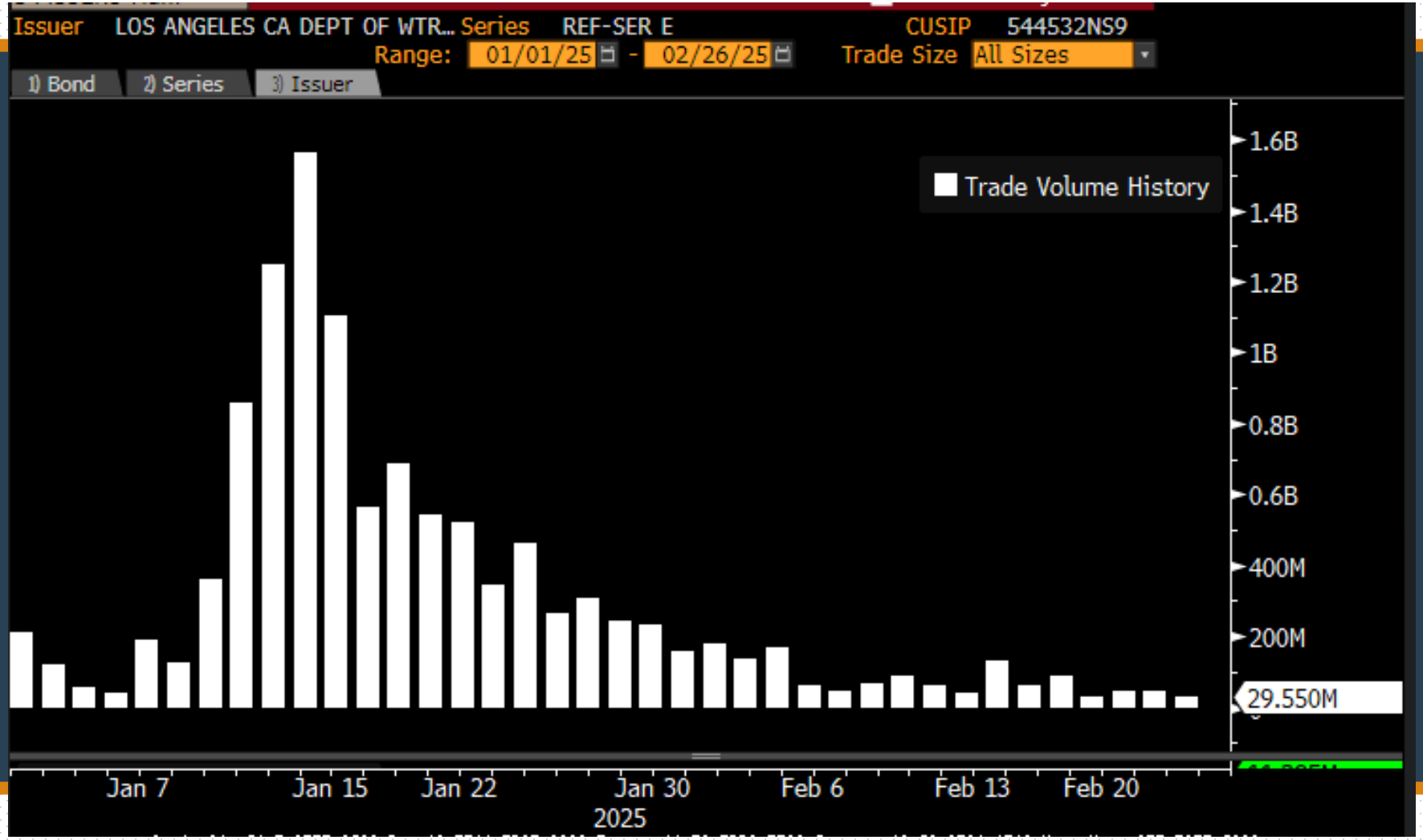
Good Disclosure Includes Discussion of:

- Hazardous risk exposure level of severity
- Risk mitigation strategy and actions taken
- State mandates
- Insurance coverage
- Capital mitigation plans, projected cost, and financing plan

What Does An Investor Look at When a Disaster Hits?

- Size of area impacted relative to service area or tax base
- Disaster response efforts
- Eligibility for state and federal aid
- Impact to revenues and expenses
- Issuer's financial flexibility
  - Liquidity and financial reserves
  - Ability to raise taxes or rates
- Estimate of financial liability
- Market and rating agencies' response

Los Angeles Department of Water & Power, Power System: Impact on Trade Volume from the January 2025 Palisades Fire



Source: Bloomberg

Los Angeles Department of Water & Power, Power Bonds: Impact on Yields from the January 2025 Palisades Fire

Source: Bloomberg

CUSIP 544532NS9: Issued at a 2.84% yield in November 2024, 7/1/2034 maturity, $59.7 million outstanding

What Drove Market Volatility?

- Fast-moving, uncontrollable nature of the wildfires
- Headlines – mass evacuations, images of Los Angeles on fire, loss estimates
- Inverse condemnation concerns combined with lack of information on LADWP liability for the Palisades Fire
- Selling by investors with low risk tolerance
- Rating agency negative rating actions
- Lack of investor outreach

What Calmed the Markets?

- Moody's January 17 report stating LADWP's power equipment did not appear to be the ignition source for the Palisades Fire
- Moody's commentary that LADWP's Water System operated as designed
- Buying by investors with higher risk tolerance
- Containment of the fires, reduced headline news
- LADWP reports of water and power restored to the burned areas, rapid Phase I (hazardous waste) clean up

QUESTIONS?

DANIEL DEATON
Partner
Nixon Peabody LLP

RENEE DOUGHERTY, CFA
Director, Municipal Research
Charles Schwab Asset Management

BRIAN MCCARTAN
Senior Fellow
Ceres, Inc.

JAN WHITTINGTON, PhD
Professor
University of Washington, Seattle